RapidDSL & Wireless, Inc - Comments in Reply to Petition for Reconsideration in regards to 3650 Mhz (04-151).

First off, I would like to applaud the FCC's original decision to allocate spectrum in the 3650 band for broadband networks, and for having the open mindedness to offer it in the exciting lucrative way that they did, where it was clear that the intent was to maximize the benefit for consumers and Wireless ISPs, by keeping the spirit of unlicensed spectrum but with a few added protections for the providers delivering it as non-exclusive licensing. It offered the perfect balance between licensed and unlicensed allocation, and allowed its use to be obtainable by the many small WISPs making their mark across the country successfully today. However, the recent petition for reconsideration has brought significant concern.

A request was previously suggested to split the band, half for contention based and half for Wimax (non-contention based). Under no circumstances should the band be split. It would be the worst thing that could happen. The bottom line is that providers need the whole 50 Mhz usable under a consistent method in order to use it competitively for the indented purpose. 3.650 Ghz needs to be compared with how 5.8Ghz is used today. 5.8Ghz has 100 Mhz available and its not enough. 3.650 Ghz is already only half the size of the 5.8Ghz space. WISPs need the ability to move around channels to steer around interference, and need multiple channels to deploy smarter designed sector topologies to optimize non-interference. ISPs need large channels, so they can deliver optimal speed, and can compete on a level playing field inline with cable and DSL offerings. There must be enough spectrum channels available for multiple providers in a single area. The only way to accomplish this is to have the whole 50 Mhz available in a consistent manor. Splitting the band would just result in WISPs having to buy two totally different types of equipment to successfully deploy 360 degrees at a single cell site, adding confusion and unnecessary overhead. I support the decision for the band to be only for contention based protocols, because it encourages innovation by manufacturers for better spectrum sharing technologies. However, if having that also meant splitting the band, I'd rather have the whole band on a non-contention based method. Whether allocated for contention based or not, having it consistent and the full spectrum available, it gives the operators the best opportunity to effectively use the band to its potential for its intended purpose. Whether a deployment is contention based or not, is just a design decision that a provider will need to make, but providers can adapt their design to either method, as long as there is physically enough spectrum for them to effectively deploy.

The second misconception I'd like to clear up is the claim that small channel size can deliver much higher speeds using more advanced modulation types. This misconception should not be used to determine channel size and band size. One big advantage of the 3650 rules is allowable higher power output of 25 watts. This will help providers use the spectrum to tackle NLOS environments, a requirement desperately needed by WISPs. But in most NLOS application advanced modulations often do not deliver the anticipated results. For example, in our live trials in Washington DC this year, we attempted to use 16QAM for supposedly 14 mbps speeds in 6 Mhz channels. What we learned was that we got 14 mbps in LOS situations, but in NLOS situations, we were lucky to get 2 mbps.

The advanced modulations often could not survive high noise floors, nor lower signal strengths due to NLOS. I fully support a proposed requirement that radios in the 3650 band must support higher advanced modulations, but only as a user selectable option, not a requirement that the modulation be used. The reason is that not all providers will be deploying in the same type of environments, and their needs may vary, and the bottom line is reliable signal must be delivered to the consumer. Reliability is more important than speed. In the past, some manufacturers had only offered higher modulations as an additional cost upgrade. That was bad for the industry for these cost barriers to exist. It discouraged WISPs from using higher modulations for better efficiency, when it was an acceptable environment for them to take advantage of the benefits of higher speed modulations, such as smaller channels sizes, at a penalty to other WISPs.

I do not believe that the max possible speeds sometimes obtainable using advance modulations, should be the basis for determining allowable channel sizes within the band. For example, in a NLOS environment, to deliver 360 degrees coverage using 5 sectors, it may require 10 Mhz channel sizes, the full 50 Mhz total, in order to reliably offer 5 mbps per sector shared capacity.

A suggestion had been proposed to add restrictions to the maximum channel size within the band. I believe WISPA suggested 10 Mhz. I agree with the concept, but not with the suggested size. 10 Mhz might have been appropriate for a 100 Mhz band, but not for a 50 Mhz band. Instead, the channel size should be determined by what are the typical sector antenna types. Typical types are 60 degree, 90 degree, and 120 degree. One of the big problems with 5.8Ghz is that ISPs had to often deploy 6 sectors to get 360 degrees. This was over costly and unnecessary for small areas, where there are a limited number of subscribers. I believe operators should have the right to deploy 3 or 4 sector deployments to reduce cost, without the penalty of loosing the max bandwidth potential of the band. There shouldn't be a problem with small rural areas using the whole band because there is nobody to interfere with. So I'd like to see the max channel size correlate to 120 degree or 90 degree sector design. So in theory, the maximum channel size should be, 50 Mhz divided by the number of sectors. So max channel size of 12.5 Mhz for 90 degrees or max channel size of 16.6 Mhz for 120 degrees. My preferred suggestion would be to have the max channel size allowable in 3650 be 16.6 Mhz. However, ideally, it would be nice if there was a requirement for the manufacturers to make the radios support user selectable channel sizes in a range from 16.6Mhz down to 6 Mhz.

Another proposed suggestion was to reduce the usability of 3650 within the 25 major markets, and only have the band indented for rural America. I highly recommend against this limitation. I specifically identify the DC Metropolitan area as an area needing to utilize the 3650 band. The reason is that rural areas really don't need the spectrum as much as suburban and urban areas. The truth is, in a rural area, there are fewer subscribers, and therefore less bandwidth and channels needed to serve them, and fewer providers with the need to share the spectrum. As a result, the combination of unlicensed spectrum 900 Mhz, 2.4Ghz, 5.3 Ghz, and 5.8Ghz is probably already enough spectrum to support the small number of users in rural America. Although, the higher power levels

available in the 3650 band will be highly attractive to rural America to overcome NLOS and long distances. However, suburban and urban areas have a serious problem. There are many players in these markets, many potential subscribers to serve, more interference, and more competition. 900 Mhz is often unusable due to interference. 5.3 Ghz typically can't survive NearLOS obstructions adequately due to its low power levels. 2.4 Ghz is maxed out on every corner via a wide range of applications from home gateways, to city hotspots, to WISPs, to home phones. 5.8Ghz has been proven to be ideal spectrum, but there just isn't enough to go around. WISPs like us, monopolize it, because its all we have, and its all needed to serve the prospective client base. Suburban and Urban areas are urgently in dire need of more spectrum. 3650 is perfect for the need. Wireless is ideal for serving the underserved. What people so often forget is that urban areas have the highest number of underserved consumers in the country, and that suburban areas have the second highest number of underserved consumers. We estimate 20% of suburban and urban consumers are without adequate broadband options. These are the consumers who live in the holes between DSL and Cable coverage areas. It is absolutely imperative that 3650 be available in as many places as possible in America, not only Rural areas, if ALL American are to be treated equally regarding the right to receive broadband. If there are areas that are clearly not eligible for 3650 under the current rules, due to interference with existing satellite technologies, I fully support WISPA recommendations that 3650 at least be usable by providers at lower power level on a secondary use basis and non-interference requirement.

There is strong support by WISPs to keep the requirement for contention-based protocols, in order to support fair-shared use of the spectrum. A typical example of a deployment model that contention based would avoid, is the Motorola Canopy model that potentially could allow a single provider to monopolize the entire band in an area, by syncing transmissions of all cell sites and continual transmission of carriers. However, I feel contention based is over rated as the ultimate solution, and I have mixed feelings about the subject, and therefore am not decided on what I feel is the best choice. The reason is that if a radio doesn't transmit, others don't know for sure whether their deployment will interfere with the existing systems in place. In the Canopy model, where it always broadcasts regardless of whether there is data to send, others at least know that the Canopy is there. This allows radio operators to design their networks from the start around the interference that they hear in an area. This concept has worked for unlicensed spectrum deployments. The problem with fair spectrum sharing protocols, such as contention based, is defining what is truthfully fair? Is it fair to sell 10 mbps service to consumers, and then 1 year later have the capacity drop down to 2 mbps because 5 more providers come to town and deploy? Quality of service is stolen from the users that originally had a better service. Rather than sharing time slices, resulting in everybody transmitting slower, I think maybe there could be a better answer. Make radios better able to withstand interference. One brilliant man once said, radio waves do not interfere; radios just have a hard time distinguishing between the different waves that arrive at the radio and hearing them above the noise. So the idea is to make radios smarter and more resilient to survive interference and noise. The advantage of TDD systems, like Trango, Canopy, and WiMax is that they can offer QOS that contention based is less likely to be able to deliver. I'd argue that consumers desire QOS as their top priority. Its not that I

don't support contention based protocols, and it is clear to me that full fledged time based protocols like Wimax 802.16e would not be in the spirit of spectrum sharing. But what if something could be offered halfway in between? I suggest that the FCC consider the possibilities of new protocols like 802.16h, an attempt to bridge the gap between time based and contention based protocols. I fully support the FCC's initial policy that they would consider any contention-based protocol brought to the table that has merit, and that more than one protocol could be selected. This is imperative to prevent any one manufacturer from controlling the marketplace. WISPs need competition between its manufacturers. Above all WISPs need cost effective gear. And when there is competition between manufacturers, WISPs are most likely going to be able to continue to get better features and better prices as time goes by. Standardization, compatibility, and coexistence, is not as important as creating a environment that manufacturers will likely make gear for the spectrum at price levels that will allow small WISPs grow to cater to the masses. In unlicensed spectrum, WISPs survived against all odds and interference, and we can do it better in 3650 with the added protection of non-exclusive licensing.

It is imperative that the COMPLETE band stays under the initially proposed non-exclusive license model. Under no circumstances should the band change to a typical fully licensed method. The beauty of the FCC's original allocation rules is that it is licensing the spectrum on a non-exclusive basis, in the spirit of WISPs that deployed unlicensed technology. WISPs fear that there may be somewhat of a conspiracy in place where some are attempting to protest the FCC's revolutionary initial allocation of 3650, in order to take over the 3650 band for their own special interest, such as a secondary band for Telco carriers or a Wimax band for high dollar equipment marketed to ILECs. The best use of the spectrum is the original intent, for use by the small independent WISP to provide Wireless broadband.

With the recent deregulation of DSL, the FCC voting to remove ILECs requirement to Line Share, and the tragic loss of the BrandX case, no longer requiring cable companies to share their networks, independent ISPs are in dire need of a viable survivable transport technology. Independent ISPs will look to Fixed Wireless Broadband. Unfortunately, what the FCC has really accomplished is that while wiping out competition to the Monopolies, they have created a huge amount of competition for WISPs. Basically taking the Monopolies' competitors, the 7000 small Independent ISPs, and sending them to go after the small amount of Spectrum that the WISP community has had to work with. WISPs are small emerging businesses that need protection to prosper, not greater competition in there market place. More spectrum is needed to support the huge increase in player, to include both ISPs and WISPs as one. 3650 has often been referred to as a gift to WISPs. Finally a band with some added protections, designed specifically for WISPs, to better service the underserved. WISPs deserve the use of this band because WISPs have proven to utilize bands to their maximum efficiency in the most adverse conditions for the optimal benefit of consumers nationwide. We earned the right to more spectrum, by demonstrating real world results. In my mind, Independent ISPs and WISPs are more or less bread from the same family, and the ISPs of today likely will join the ranks of WISPs of tomorrow. The FCC MUST protect the sanctity of the Independent ISP and WISP. We need a level playing field in order to truly offer competitive services

to the market place. 3650 is an opportunity to help level the playing field. My suggestion is to make 3650 a band allocated specifically to small wireless providers. Use it as a band to guarantee that competition will stay in the market place, and that small independent ISPs will always have a band available to them to maintain fair competition. Lets set a limit to who can qualify for a non-exclusive license of 3650. For example, don't allow any one to be granted a license in 3650 that currently does over 50 million a year in revenue. Or not let a carrier with monopoly status qualify for the license. Why have WISPs fight the manufacturers and Wimax, the standard is not the enemy. If Wimax is granted access to 3650 that's fine, but make it so it will encourage partnerships with and investment into the WISP community and create support for the small local ISP. Make it so manufacturers can't only make high dollar Wimax gear at rates that only national carriers can afford, but force manufacturers to make gear with the small local WISP in mind, since they are the ones that would be allowed to use the band. Cable companies have cable that we can't touch. ILECs have copper wire that we can't touch. But they have the right to monopolize available unlicensed spectrum, that WISPs use as it sits today. WISPs don't truly have spectrum of their own, nor a fair competitive playing field because of this. Why not truly make 3650 a band for the WISP. Today, we mask the true intent, by enforcing inefficient protocols like contention-based protocols. Maybe what we really need to be doing is look at what WISPs are successfully doing today, and just allocating a band exclusive to the cause. Under the initial FCC allocated rules, it was in the spirit to support WISPs. If Wimax were to be allowed in the band, I would embrace it, only if it also added a requirement that license holders must not exceed a maximum revenue requirement or percentage of the market, to guarantee that the band stayed for its original purpose to foster the advancement of small independent ISPs and WISPs.